

CLAIMS

The following is a complete listing of the pending claims with a status identifier in parenthesis.

LISTING OF CLAIMS

1. (Currently Amended) A seal mechanism for confining a chemical reaction in a reaction vessel having an inner volume that is accessible through a penetrable, self-sealing diaphragm covering an opening of the reaction vessel and through which reagents are at least one of injected and extracted; said seal mechanism comprising
a movable plunger cooperating with said self-sealing diaphragm, said plunger being reversibly operable between a retracted position wherein the inner volume of the reaction vessel is accessible through the diaphragm, and an operational position in abutting contact with the diaphragm, wherein
the plunger is effective to counteract an outward deflection of the diaphragm caused by an increase of internal pressure in the vessel, and
in the operational position, the movable plunger is in abutting contact with a portion of the diaphragm through which the inner volume of the reaction vessel is accessible.
2. (Original) The seal mechanism of claim 1, wherein the plunger is pivotally movable about an axis (C).
3. (Original) The seal mechanism of claim 1, wherein the plunger is driven for a linear motion in axial direction of the vessel.

4. (Original) The seal mechanism of claim 1, wherein the plunger is driven in a motion having a generally axial component and a generally radial component with respect to the axial direction of the vessel.
5. (Previously Presented) The apparatus of claim 21, wherein a pressure detector is supported on the plunger.
6. (Previously Presented) The apparatus of claim 5, wherein a pressure monitor is connected with the plunger and by which the plunger is controlled to apply an external pressure on the diaphragm that is related to the detected internal pressure generated by the chemical reaction in the reaction vessel.
7. (Previously Presented) The seal mechanism of claim 2, wherein the drive unit controls the pivoting motions and applied pressure of the plunger via the link mechanism.
8. (Currently Amended) An apparatus for performing chemical reactions, comprising:
 - one or more reaction vessels supported and successively movable to a position for microwave energy exposure, each reaction vessel having a penetrable, self sealing diaphragm covering an opening of the reaction vessel;
 - a dispenser capable of penetrating the self-sealing diaphragm for at least one of injection and extraction of reagents into the reaction vessel where the chemical reaction takes place; and
 - a movable plunger cooperating with said one or more reaction vessels in the microwave exposure position, the plunger being reversibly operable between a retracted position wherein an inner volume of the vessel is accessible through the diaphragm, and an operational position in abutting contact with the self sealing diaphragm, wherein

the plunger is effective to counteract an outward deflection of the diaphragm caused by an increase of internal pressure in the vessel and

in the operational position, the movable plunger is in abutting contact with a portion of the diaphragm through which the inner volume of the reaction vessel is accessible.

9. (Original) The apparatus of claim 8, wherein the plunger is pivotally supported to be pivoted about an axis (C).
10. (Previously Presented) The apparatus of claim 9, wherein the plunger is associated with the driver by which the plunger is pivoted via the link mechanism.
11. (Previously Presented) The apparatus of claim 9, wherein a pressure detector is supported on the plunger.
12. (Previously Presented) The apparatus of claim 10, wherein a pressure monitor is connected with the plunger.
13. (Previously Presented) The apparatus of claim 12, wherein the pressure monitor continuously dimensions the external pressure applied by the plunger relative to the detected internal pressure in the reaction vessel.
14. (Previously Presented) An automated system for performing chemical reactions, the system comprising:
 - control logic and operator interface for monitoring and evaluation of the chemical reactions; and
 - the apparatus of Claim 8.

15. (Currently Amended) A method for confining a chemical reaction in a reaction vessel that is accessible through a self-sealing diaphragm covering an opening of the reaction vessel, the method comprising the steps of injecting/extracting reagents through the self-sealing diaphragm, and applying a controllable counter pressure to an external side of the diaphragm that counteracts an outward deflection of the diaphragm caused by an increase of internal pressure in the vessel, the external side of the diaphragm being the same portion of the diaphragm through which reagents are injected/extracted.
16. (Previously Presented) The method of claim 15, wherein a plunger is pivoted about an axis (C) between a retracted position wherein the diaphragm is accessible for injection and/or extraction by a dispenser, and an operational position wherein the plunger is controlled to apply an external pressure in abutting contact with the self-sealing diaphragm.
17. (Original) The method of claim 15, wherein the internal pressure of the vessel is monitored.
18. (Original) The method of claim 17, wherein the external pressure applied by the plunger is continuously dimensioned in relation to the detected internal pressure.
19. (Previously Presented) A seal mechanism for confining a chemical reaction in a reaction vessel having an inner volume that is accessible through a penetrable, self-sealing diaphragm covering an opening of the reaction vessel and through which reagents are at least one of injection and extraction, said mechanism including a movable plunger cooperating with a self-sealing diaphragm, said plunger being reversibly operable between a retracted position wherein the inner volume of a reaction vessel is accessible through the diaphragm, and an operational

position in abutting contact with the diaphragm, wherein the plunger is effective to counteract an outward deflection of the diaphragm caused by an increase of internal pressure in the vessel, said seal mechanism confining the chemical reaction in the reaction vessel according to the method of claim 15.

20. (Previously Presented) An apparatus for confining a chemical reaction in one or more reaction vessels, the apparatus including the one or more reaction vessels supported and successively movable to a position for microwave energy exposure, each reaction vessel having a penetrable, self sealing diaphragm covering an opening of the reaction vessel, a dispenser capable of penetrating the self-sealing diaphragm for at least one of injection and extraction of reagents into the reaction vessel where the chemical reaction takes place, and a movable plunger cooperating with said one or more reaction vessels in the microwave exposure position, the plunger being reversibly operable between a retracted position wherein an inner volume of the vessel is accessible through the diaphragm, and an operational position in abutting contact with the self sealing diaphragm, wherein the plunger is effective to counteract an outward deflection of the diaphragm caused by an increase of internal pressure in the vessel, said apparatus confining the chemical reaction in the one or more reaction vessels according to the method of claim 15.

21. (Previously Presented) An apparatus, comprising:
the sealing mechanism of claim 1; and
the reaction vessel having the inner volume that is accessible through the diaphragm covering the opening of the reaction vessel and through which reagents are at least one of injected and extracted.

22. (Previously Presented) A seal mechanism for confining a chemical reaction in a reaction vessel having an inner volume that is accessible

through a penetrable, self-sealing diaphragm covering an opening of the reaction vessel and through which reagents are at least one of injected and extracted; said seal mechanism comprising

a movable plunger cooperating with said self-sealing diaphragm, said plunger being reversibly operable between a retracted position wherein the inner volume of the reaction vessel is accessible through the diaphragm, and an operational position in abutting contact with the diaphragm, wherein

the plunger is effective to counteract an outward deflection of the diaphragm caused by an increase of internal pressure in the vessel, and

a linear drive unit controls pivoting motions and applied pressure of the plunger via a link mechanism.

23. (Previously Presented) An apparatus for performing chemical reactions, comprising:

one or more reaction vessels supported and successively movable to a position for microwave energy exposure, each reaction vessel having a penetrable, self sealing diaphragm covering an opening of the reaction vessel;

a dispenser capable of penetrating the self-sealing diaphragm for at least one of injection and extraction of reagents into the reaction vessel where the chemical reaction takes place; and

a movable plunger cooperating with said one or more reaction vessels in the microwave exposure position, the plunger being reversibly operable between a retracted position wherein an inner volume of the vessel is accessible through the diaphragm, and an operational position in abutting contact with the self sealing diaphragm, wherein

the plunger is effective to counteract an outward deflection of the diaphragm caused by an increase of internal pressure in the vessel, and

the plunger is associated with a linear driver by which the plunger is pivoted via a link mechanism.